edwardsvacuum.com

# nEXT TURBOMOLECULAR PUMPS

EDWARDS



# EDWARDS THE PARTNER OF CHOICE

Edwards is a world leader in the design, technology and manufacture of vacuum pumps, with over 100 years' history and more than 80 years' manufacturing experience.

We believe in delivering results that bring value to our customers by using our breadth of industry experience to identify and apply solutions to your problems. Using the most innovative and up-to-date modelling techniques and know-how, we can optimise the pumping configuration to achieve the maximum performance in the most reliable and cost-effective way.



# INNOVATION AND RELIABILITY

## Edwards nEXT is the ultimate experience in turbomolecular pumps

nEXT turbomolecular pumps are built on decades of experience and are drawing from our tried and trusted EXT and STP ranges. nEXT pumps offer superior performance, reliability and end user serviceablity, setting the benchmark for scientific turbomolecular pumps.

**Superior performance**
Exceptional pumping speeds and compression ratios

**Proven reliability for peace of mind**
Huge install base of turbo pumps

**Flexible solutions**
Bespoke design service available

**Ease of use**
Integrated intelligent controls

**Extended lifetime and low cost of ownership**
Fully end user serviceable

**Large variety of standard variants**
Enhanced customer choice



**nEXT85**



**nEXT240**



**nEXT300**



**nEXT400**

## Applications

**Research & Development**

» Chamber evacuation, coating systems, turbomolecular pump systems

**High Energy Physics**

» Beam Lines, accelerators, mobile pump carts, turbomolecular pump backing, laser evacuation, medical systems

**Mass Spectrometry**

» GCMS, LCMS, ICPMS, MALDI, inorganic MS, RGA, surface science, leak detectors

**Electron Microscopy**

» TEM, SEM, EPMA, sample prep benches

**Industrial**

» Glove boxes, coating systems, XRD/XRF systems, lamp evacuation

You can be assured Edwards has the application expertise and vacuum solution to meet your needs.

# ADVANCED TECHNOLOGY

nEXT has been designed to combine all the latest technological advances in turbomolecular pumps with some new thinking in design for manufacture, delivering a truly class leading product.

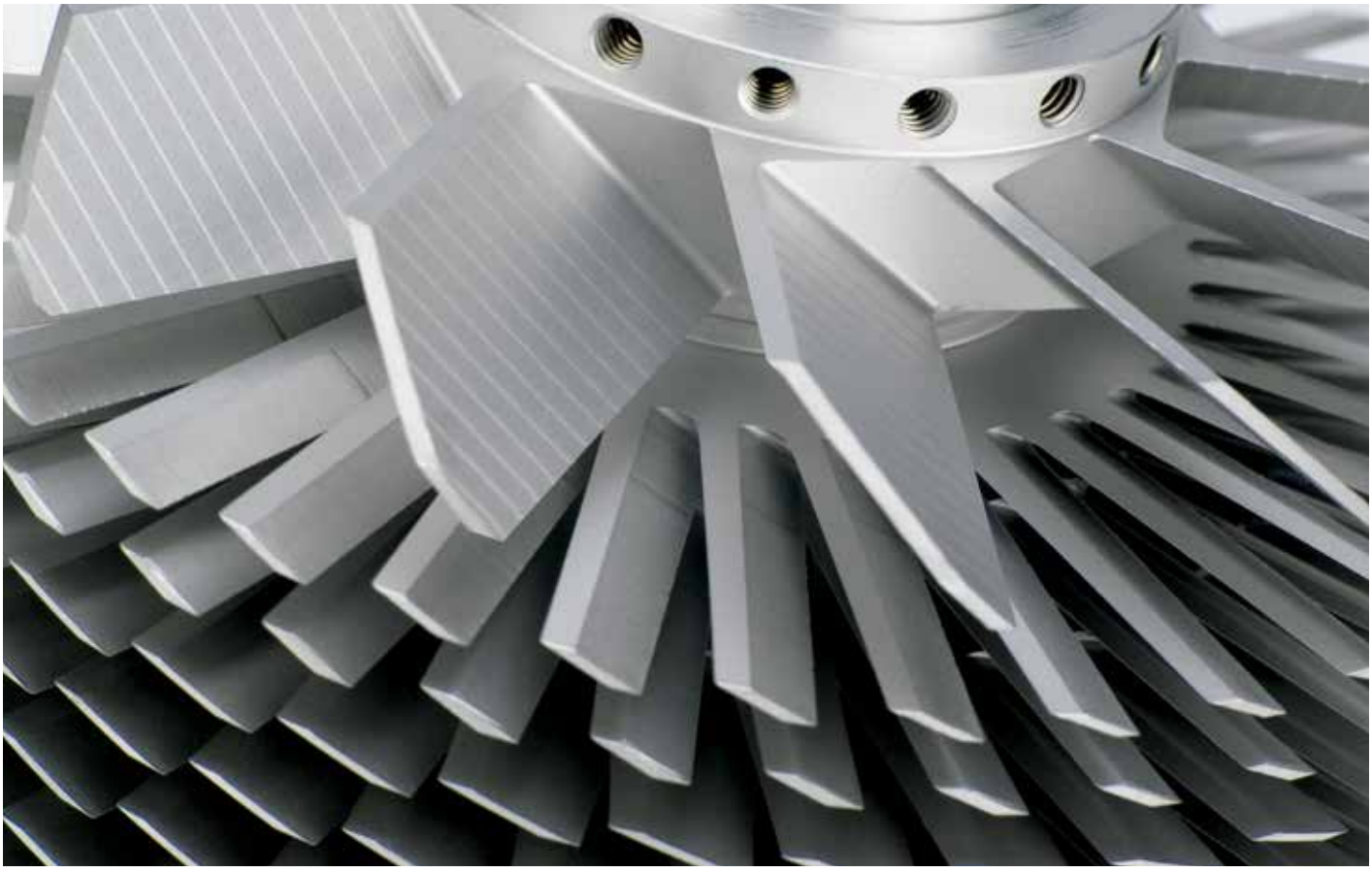
The nEXT platform brings a high level of modularity to offer maximum flexibility for customer application and requirements. Each pump is available in different internal configurations to offer differing functionality and performance.

On nEXT240, 300, 400 Duplex “D” variants with both turbomolecular and drag stages for improved tolerance to higher backing line pressures. Triplex “T” variants feature turbomolecular, drag and Edwards unique regenerative pumping stages for the ultimate in compression ratio and boost technology for unique vacuum system rationalisation.

On nEXT85 pumps are available in “D” and “H” variants. The “D” variants offer superior pumping speed and compression across all gas species. Where an application has a focus on light gas compression, the “H” variant has been physically tuned to offer an improvement in this.

nEXT is available in four pumping speeds and a range of inlet flange sizes

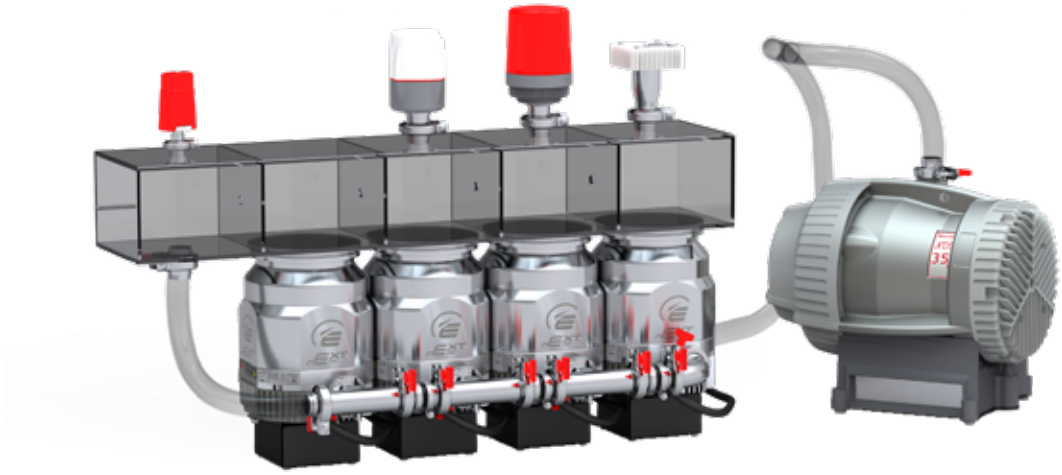
| | | | |
|---|---|---|---|
| • **nEXT85**<br>NW40 or<br>DN63 ISO-K, DN63 ISO CF or<br>DN100 ISO-K | • **nEXT240**<br>DN100 ISO-K or<br>DN100 ISO CF | • **nEXT300**<br>DN100 ISO-K or<br>DN100 ISO CF | • **nEXT400**<br>DN160 ISO-K or<br>DN160 ISO CF |



# BOOST TECHNOLOGY

For our Analytical Instrument Customers the “T” variants of nEXT 240,300,400 employ a unique regenerative pumping stage which can be used to ‘boost’ the performance of the backing pump. This offers a much simplified vacuum solution with greatly improved pumping speeds and system power reduction. The example in the image below shows how the boost ports can be used to replace a primary pump on a differentially pumped system.

Customers in general laboratory and R&D applications will also benefit from the improved compression achieved with the "T" variant. To take maximum advantage of boost technology, please contact Edwards.



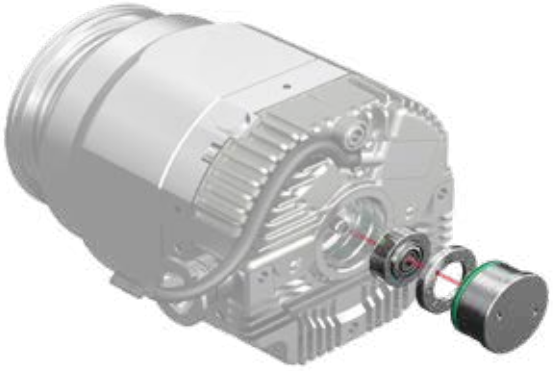
# END USER SERVICEABLITY

New technologies employed in nEXT have enabled the pumps to be serviced by the end user in the field. An oil lubrication cartridge change can be performed, where access allows, typically in less than 5 minutes and a full bearing change can also be performed by the end user in around 10 minutes both with the minimum of specialist tooling. These simple interventions will, in many cases, mean that the pump never requires a full return to base service during its lifetime.

nEXT turbomolecular pumps will advise the user when a service is due and what level of intervention is required. The user is alerted to a service request by a simple flashing LED sequence on the pumps and by serial comms notification.

Flexibility is again key as these simple services can be performed either by the end user, on site by an Edwards field service technician, or the pump can be returned to an Edwards service hub.

Using remote diagnostics, a user can interrogate the pump to determine how long it is to the next service so that a proactive approach to preventative maintenance can be planned.



# PERFORMANCE YOU CAN RELY ON

The compact design of nEXT allows for close pitch positioning in multiple pump installations. Backwards compatible with existing EXT and DX ranges offering superior performance in a smaller space envelope. Compatible with Edwards TIC and TAG controllers.

Multiple drag stages for higher compression ratios and greater backing pressure tolerance

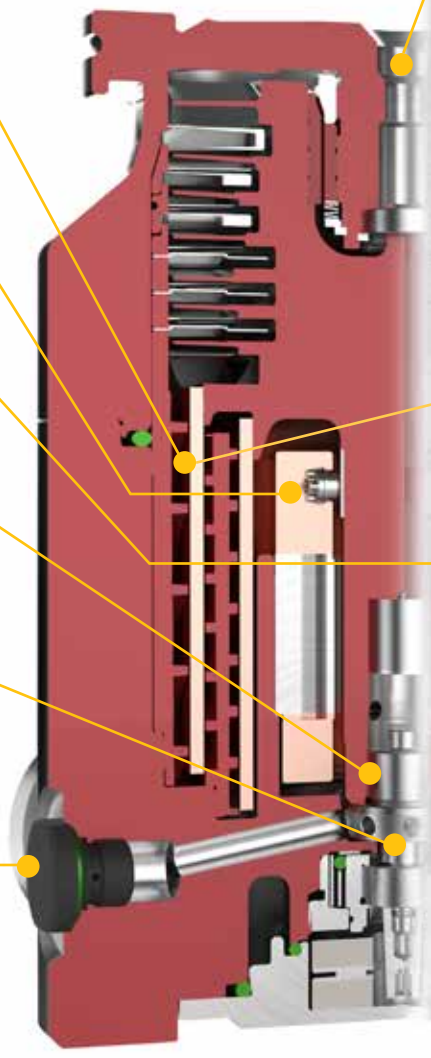
Direct temperature measurements within the pump enables wider operating envelope (nEXT85 only)

Third regenerative stage enables boost port options and higher compression (nEXT240, 300, 400 only)

Patented bearing suspension system minimises noise and vibration transmitted to vacuum system

User replaceable oil cartridge for a speedy interim service and bearing cartridge for a quick low cost scheduled overhaul

Purge port for safe operation of pump with specialised gases



nEXT85 turbomolecular pump sectional view



Permanent magnet upper bearing for a hydrocarbon free vacuum, reduced vibration and minimum wear

Advanced simulation tool derived rotor design to give better speed and compression performance

Manual vent port with automatic valve accessories for rapid venting and quick cycle times

Manual as well as serial setting of standby speed for flexible system tuning

Simple parallel operation or more sophisticated serial control in both RS232 and RS485 protocols

Automatic wide operating voltage range from 24V to 48V d.c. for versatility in system integration

Sensorless drive for high efficiency and compactness with reduced stray magnetic fields

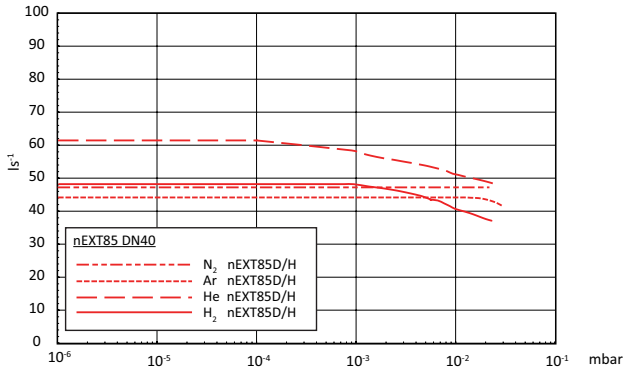
nEXT300 turbomolecular pump sectional view

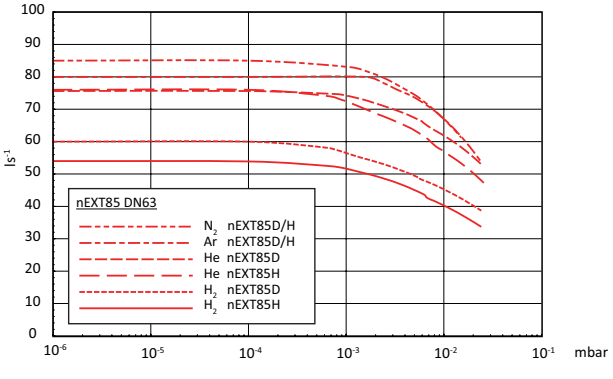
## Technical specifications

| | | nEXT85 | | | nEXT240 | nEXT300 | nEXT400 |
|---|---|---|---|---|---|---|---|
| Inlet flange | | NW40 | DN63 ISO-K or DN63 CF | DN100 ISO-K | DN100 ISO-K or DN100 CF | DN100 ISO-K or DN100 CF | DN160 ISO-K or DN160 CF |
| Inlet pumping speed $ls^{-1}$ | $N_2$ | 47 | 84 | 86 | 240 | 300 | 400 |
| | Ar | 44 | 80 | 84 | 230 | 280 | 380 |
| | He | 61 | 78 | 80/78 (D/H) | 230 | 340 | 390 |
| | $H_2$ | 49/44 (D/H) | 60/54 (D/H) | 60/54 (D/H) | 165 | 280 | 325 |
| Compression ratio (D) | $N_2$/Ar | >1 x $10^{11}$ | >1 x $10^{11}$ | >1 x $10^{11}$ | >1 x $10^{11}$ | >1 x $10^{11}$ | >1 x $10^{11}$ |
| | He | 8 x $10^6$ | | | 3 x $10^5$ | 1 x $10^6$ | 1 x $10^8$ |
| | $H_2$ | 2 x $10^5$ | | | 1 x $10^4$ | 5 x $10^4$ | 5 x $10^5$ |
| Compression ratio (T/H) | $N_2$/Ar | >1 x $10^{11}$ | >1 x $10^{11}$ | >1 x $10^{11}$ | >1 x $10^{11}$ | >1 x $10^{11}$ | >1 x $10^{11}$ |
| | He | 2 x $10^7$ | 2 x $10^7$ | 2 x $10^7$ | 1 x $10^6$ | 3 x $10^6$ | >1 x $10^8$ |
| | $H_2$ | 5 x $10^5$ | 5 x $10^5$ | 5 x $10^5$ | 1.5 x $10^4$ | 1 x $10^5$ | 1 x $10^6$ |
| Backing/interstage/boost ports | | NW16 | | | NW25 | NW25 | NW25 |
| Vent/purge port | | 1/8" BSPP | 1/8" BSPP | 1/8" BSPP | 1/8" BSPP | 1/8" BSPP | 1/8" BSPP |
| Critical backing pressure (D/H) | mbar | 18 | | | 9.5 | 9.5 | 10 |
| Critical backing pressure (T) | mbar | NA | | | 20 | 20 | 20 |
| Water cooled/forced air cooled max. bake out | °C | 120 / 115° | 120 / 115° | 120 / 115° | 120 / 115° | 120 / 115° | 120 / 115° |
| Recommended backing pump* | | nXDS15 | nXDS15 | nXDS15 | RV12/nXDS10i | RV12/nXDS10i | RV12/nXDS10i |
| Normal rotational speed (rpm) | | 90,000 | 90,000 | 90,000 | 60,000 | 60,000 | 60,000 |
| Start time to 90% speed (sec) D/H (T) | | 90 | 90 | 90 | 115 (150) | 145 (190) | 180 (210) |
| Mass (kg) D/H (T) | ISO | 2.9 | 3.0 | 3.2 | 5.7 (6) | 5.7 (6) | 6.5 (6.8) |
| | CF | | 4.4 | | 8.8 (9.1) | 8.5 (8.8) | 9.5 (9.8) |

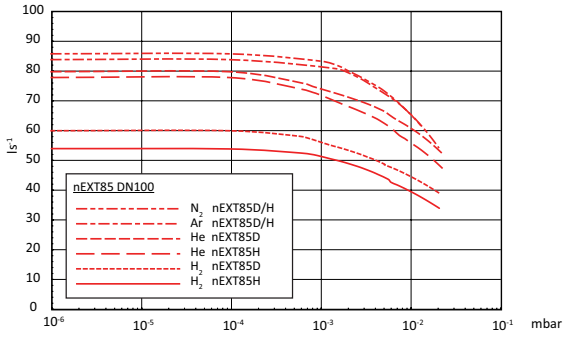
* a smaller backing pump may be used depending on application.

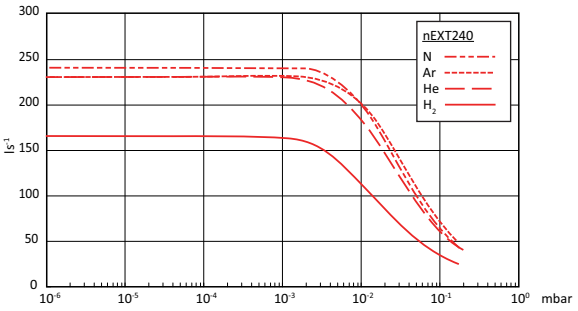
## Performance

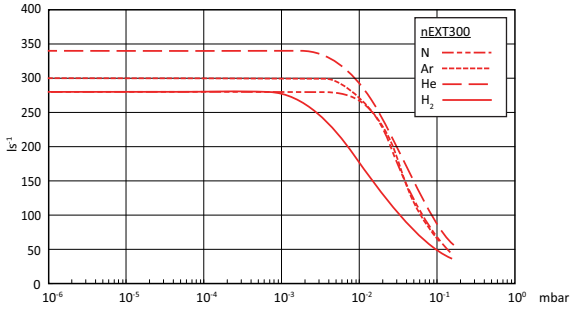


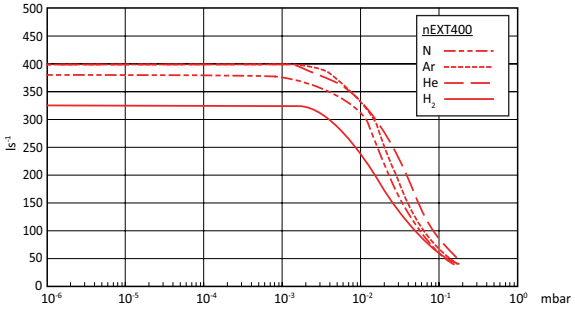



## Performance



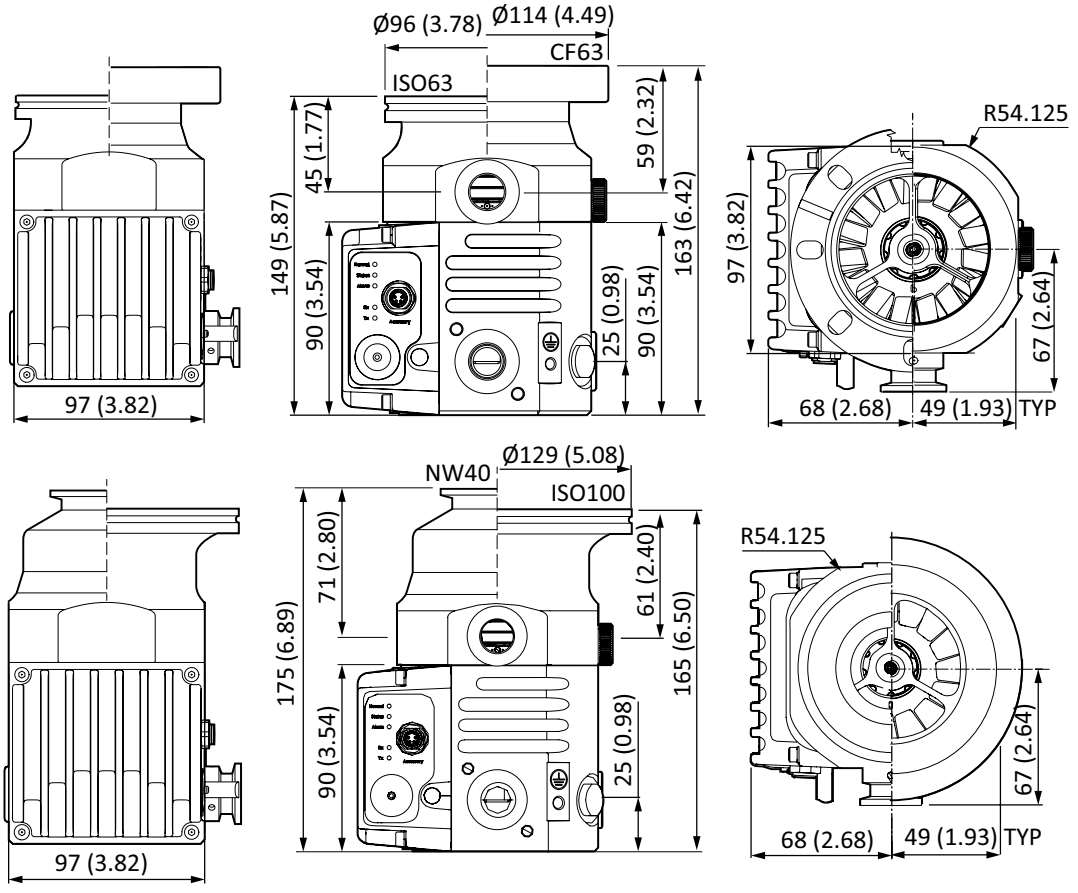



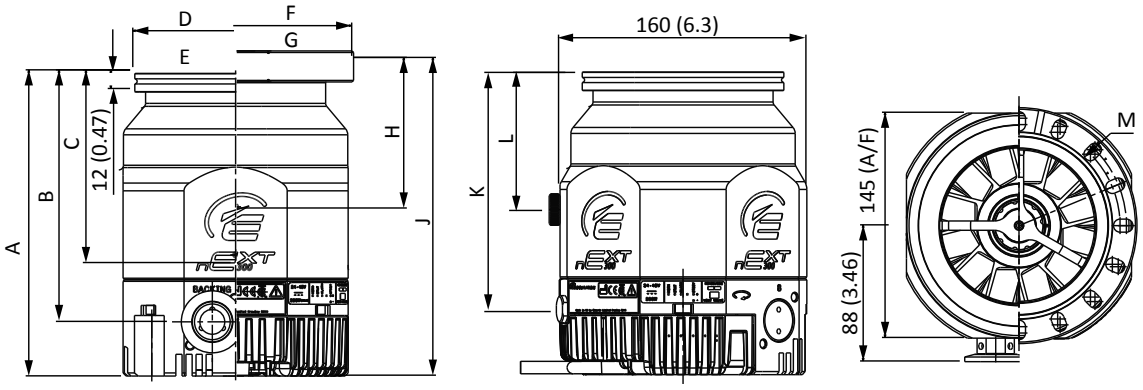

## Dimensions

nEXT85



## Dimensions

nEXT240/300/400




| | nEXT240 | nEXT300 | nEXT400 |
|---|---|---|---|
| A | 189 | 195 | 195 |
| B | 155 | 160 | 160 |
| C (C of G) | 116 | 117 | 102 |
| D | 130 | 130 | 180 |
| E | ISO100 | ISO100 | ISO160 |
| F | 152 | 152 | 202 |

| | nEXT240 | nEXT300 | nEXT400 |
|---|---|---|---|
| G | CF100 | CF100 | CF160 |
| H (C of G) | 90 | 100 | 81 |
| J | 197 | 210 | 200 |
| K | 147 | 153 | 153 |
| L | 83 | 87 | 89 |
| M | (16)Ø8.4 | (16)Ø8.4 | (20)Ø8.4 |

## Controllers and accessories




The **TIC (Turbo and Instrument Controller)** automatically recognises and supports one turbomolecular pump from the nEXT range, plus three Edwards active gauges. Cooling and vent valve support is provided directly from the controller. Backing pump power is provided for a compact 24V diaphragm pump (on 200W versions only), or where greater pumping speeds are required, mains backing pumps (up to RV12) may be controlled via an optional relay box.

nXDS and large XDS pumps can be controlled directly via the backing pump connector on a TIC 200. The relay box can also be used to control a mains heater band and backing line isolation valve. Time delays and normal speed signals may be used to control events such as turbo start and there is a comprehensive selection of protection and safety interlock features. The TIC turbo controller may be either rack or bench mounted and provides a useful hub for the flexible operation of a wide range of vacuum system configurations.




The **TAG (Turbo and Active Gauge)** controller is a small, compact, low cost pumping system controller, which is suitable for a wide range of vacuum applications. It is a 24V controller that is compatible with all Edwards DX and nEXT turbomolecular pumps. It contains no power source and therefore you either need to supply your own power or buy the optional power supply. In addition to a turbomolecular pump it can control a backing pump, a vent valve, an air cooler and an Edwards active gauge. The TAG controller is controlled by an easy to use interface. A large clear LED display shows the pump speed or vacuum pressure. The compact size of the controller is ideal for use on bench-tops or suitable mobile platforms.



# Ordering information

Pumps:

| Product description | Order number |
|---|---|
| nEXT85D ISO63 NW16 80W | B8G210B01 |
| nEXT85D CF63 NW16 80W | B8G210C01 |
| nEXT85D ISO100 NW16 80W | B8G210101 |
| nEXT85D NW40 NW16 80W | B8G210A01 |
| nEXT85D ISO100 NW25 80W | B8G240101 |
| nEXT85ID ISO63 NW16/16 80W | B8G211B01 |
| nEXT85ID ISO63 NW16/25 80W | B8G214B01 |
| nEXT85H ISO63 NW16 80W | B8G410B01 |
| nEXT85H CF63 NW16 80W | B8G410C01 |
| nEXT85H NW40 NW16 80W | B8G410A01 |
| nEXT85IH CF63 NW16/16 80W | B8G411C01 |
| nEXT85H ISO100 NW16 80W | B8G410101 |
| nEXT240D ISO100 160W | B81200100 |
| nEXT240D CF100 160W | B81200200 |
| nEXT240T ISO100 160W | B81300100 |
| nEXT240T CF100 160W | B81300200 |
| nEXT300D ISO100 160W | B82200100 |
| nEXT300D CF100 160W | B82200200 |
| nEXT300T ISO100 160W | B82300100 |
| nEXT300T CF100 160W | B82300200 |
| nEXT400D ISO160 160W | B83200300 |
| nEXT400D CF160 160W | B83200400 |
| nEXT400T ISO160 160W | B83300300 |
| nEXT400T CF160 160W | B83300400 |

Extended warranty:

| Warranty extension (total) | Order number |
|---|---|
| nEXT85 2 year | EW2AA5093 |
| nEXT85 3 year | EW3AA5093 |
| nEXT240 2 year | EW2AA5008 |
| nEXT240 3 year | EW3AA5008 |
| nEXT300 2 year | EW2AA5009 |
| nEXT300 3 year | EW3AA5009 |
| nEXT400 2 year | EW2AA5010 |
| nEXT400 3 year | EW3AA5010 |

Accessories and spares:

| Pump | | Product description | Order number |
|---|---|---|---|
| nEXT85 | Controller (1) | TAG controller | D39592000 |
| | | TAG power supply | D39592800 |
| | | TIC100 turbo and instrument controller | D39721000 |
| | Cooling | WCX85 water cooling kit (4 position) | B8G200833 |
| | | ACX85 air cooler connector fitted | B8G200820 |
| | Venting | N/O TAV5 vent valve connector fitted | B8G200834 |
| | | N/C TAV5 vent valve connector fitted | B8G200835 |
| | Bakeout | CF63 flange heater 110 V | B8G200823 |
| | | CF63 flange heater 240 V | B8G200824 |
| | Service | Oil cartridge kit | B8G200828 |
| | | Bearing and oil cartridge kit | B8G200811 |
| | | Bearing replacement tool kit | B8G200845 |
| | Miscellaneous | Accessory "Y" adaptor | B8G200837 |
| | | Accessory cable 90 degree / extension | B8G200836 |
| | | Accessory connector bare wired | B8G200839 |
| | | nEXT85 / EXT75DX base mounting adaptor | B8G200838 |
| nEXT240/ 300/400 | Controller (1) | TAG controller | D39592000 |
| | | TAG power supply | D39592800 |
| | | TIC200 turbo and instrument controller | D39722000 |
| | Cooling | nEXT radial air cooler | B58053175 |
| | | nEXT axial air cooler | B58053185 |
| | | nEXT water cooler | B80000815 |
| | Bakeout | CF100 100-120 V flange heater | B58052773 |
| | | CF100 200-240 V flange heater | B58052774 |
| | | CF160 100-120 V flange heater | B58052775 |
| | | CF160 200-240 V flange heater | B58052776 |
| | Venting | TAV5 solenoid operated vent valve | B58066010 |
| | Service | Oil cartridge tool kit | B80000812 |
| | | Bearing tool kit | B80000805 |
| | | Oil cartridge | B80000811 |
| | | Bearing and oil cartridge | B80000810 |
| All | Extension cables | 1 m pump to controller cable | D39700835 |
| | | 3 m pump to controller cable | D39700836 |
| | | 5 m pump to controller cable | D39700837 |
| | Power cables (1) | 2 m electrical supply cable UK plug | D40013025 |
| | | 2 m electrical supply cable EU plug | D40013030 |
| | | 2 m electrical supply cable US plug | D40013120 |
| | Miscellaneous | Vent port adaptor | B58066011 |
| | | PRX10 purge restrictor | B58065001 |
| | | TIC relay | D39711805 |

*(1) Denotes required accessory. Others optional depending on application.*

edwardsvacuum.com

Publication Number: 3601 0099 01
© Edwards Limited 2019. All rights reserved
Edwards and the Edwards logo are trademarks of Edwards Limited

Whilst we make every effort to ensure that we accurately describe our products and services, we give no guarantee as to the accuracy or completeness of any information provided in this brochure.

Edwards Ltd, registered in England and Wales No. 6124750, registered office: Innovation Drive, Burgess Hill, West Sussex, RH15 9TW, UK.

**Part of the Atlas Copco Group**

## Global contacts


| EMEA | |
|---|---|
| **UK** | +44 1444 253 000<br>(local rate) 08459 212223 |
| **Belgium** | +32 2 300 0730 |
| **France** | +33 1 4121 1256 |
| **Germany** | 0800 000 1456 |
| **Italy** | + 39 02 48 4471 |
| **Israel** | + 972 8 681 0633 |

| ASIA PACIFIC | |
|---|---|
| **China** | +86 400 111 9618 |
| **India** | +91 20 4075 2222 |
| **Japan** | +81 47 458 8836 |
| **Korea** | +82 31 716 7070 |
| **Singapore** | +65 6546 8408 |
| **Taiwan** | +886 3758 1000 |

| AMERICAS | |
|---|---|
| **USA** | +1 800 848 9800 |
| **Brazil** | +55 11 3952 5000 |